REMARKS/ARGUMENTS

Claims 5, 10, 11, 30, 32, 36, 38, 40-44, 64, 218, 230, 231, 239, 278, 331, 371, 386, 396 and 397 have been amended. Claim 234 has been canceled. Upon entry of this amendment claims 1, 2, 5-64, 96-100, 218-233, 235-325 and 327-399 will be pending in the application.

Applicants have made a number of editorial changes to the claims.

No new matter has been introduced by the present amendments.

Claim Objections

The present amendment to claim 5 is submitted as overcoming the objection in paragraph 14 of the Office action. The symbol □ was inadvertently introduced in applicants' Amendment A, filed February 27, 2003 and has been replaced with a degree symbol ° as originally filed.

Allowable Subject Matter

Applicants acknowledge the allowance of claims 1, 2, 6-43, 52-64, 96-100, 242-325 and 327-399.

The indication of allowable subject matter in dependent claims 47-51, 230 and 234-241 is also acknowledged.

Although claims 231-233 are indicated as allowed in the Office Action Summary and in paragraph 17 of the Office action, applicants understand this inclusion to be inadvertent and that these claims are rejected under 35 U.S.C. §102(b).

Rejections under 35 U.S.C. §112, Second Paragraph

Applicants respectfully request reconsideration of the rejection of claims 219-226 under 35 U.S.C. §112, second paragraph.

In paragraph 11 of the Office action, the limitation "secondary fraction" in dependent claim 219 is said to be undefined. Applicants respectfully submit that the term secondary fraction clearly denotes a portion of the reaction mixture, the latter being divided into a primary fraction and the

secondary fraction as required by claim 219. In accordance with further dependent claims 220 and 223-226, N-(phosphonomethyl)glycine product is crystallized from a secondary crystallizer feed mixture comprising N-(phosphonomethyl)glycine product obtained in the secondary fraction of the reaction mixture. In dependent claims 221 and 222, an aqueous secondary reactor feed mixture comprising N-(phosphonomethyl)glycine product and unreacted -(phosphonomethyl)iminodiacetic acid substrate obtained in the secondary fraction of the reaction mixture is introduced into a secondary oxidation zone. Accordingly, the meaning of the limitation "secondary fraction" is clear and unambiguous and the scope of protection sought in the rejected claims is readily determined.

In view of the foregoing, applicants respectfully request withdrawal of all claim rejections under 35 U.S.C. §112, second paragraph.

Rejection under 35 U.S.C. §102(b)

Reconsideration is respectfully requested of the rejection of claims 218, 227-229 and 231-233 under 35 U.S.C. §102(b). The invention defined in the pending claims is submitted as novel and patentable over the disclosure in GB 2 224 505 (Pelyva et al.).

Independent claim 218 is directed to a process for the preparation of an N-(phosphonomethyl)glycine product. The ~~process includes cooling a primary crystallization feed mixture~~ comprising N-(phosphonomethyl)glycine product produced by catalytic oxidation of an N-(phosphonomethyl)iminodiacetic acid substrate, thereby precipitating N-(phosphonomethyl)glycine product and producing a primary mother liquor comprising N-(phosphonomethyl)glycine product. The precipitated N-(phosphonomethyl)glycine product is separated from the primary mother liquor and the primary mother liquor recycled and introduced into the liquid reaction medium wherein the N-(phosphonomethyl)iminodiacetic acid substrate is catalytically oxidized to N-(phosphonomethyl)glycine. As presently amended, claim 218 requires that the N-(phosphonomethyl)iminodiacetic acid

substrate be oxidized in an aqueous liquid reaction medium in the presence of **a heterogenous oxidation catalyst comprising a noble metal on carbon** to produce a reaction mixture comprising N-(phosphonomethyl)glycine product included in the primary crystallization feed mixture.

Pelyva et al. disclose a process for the preparation of N-(phosphonomethyl)glycine by the **sulfuric acid catalyzed** oxidation of N-(phosphonomethyl)iminodiacetic acid using hydrogen peroxide as the oxidizing agent. The cited reference fails to teach or suggest the oxidation of an N-(phosphonomethyl)iminodiacetic acid substrate in the presence of a heterogenous oxidation catalyst, much less a heterogenous oxidation catalyst comprising a noble metal on carbon as now required in the process defined in claim 218.

In paragraph 15 of the Office action, allowable subject matter is indicated in original claim 230 depending from claim 218. Accordingly, in view of the inclusion in claim 218 of features from dependent claim 230, namely the requirement of oxidizing the N-(phosphonomethyl)iminodiacetic acid substrate in the presence of a heterogenous oxidation catalyst comprising a noble metal on carbon, claim 218 as amended and claims 219-230 depending therefrom are submitted as patentable over the disclosure by Pelyva et al.

The process defined in independent claim 231 is similar to the process defined in claim 218 except that the use of a heterogenous oxidation catalyst is not required. However, the process defined in independent claim 231 requires that the product mixture produced by catalytic oxidation of the N-(phosphonomethyl)iminodiacetic acid substrate **be divided** into a primary fraction and a secondary fraction. N-(phosphonomethyl)glycine product is crystallized from the primary fraction and the resulting primary mother liquor is recycled and used as a source of water in the preparation of the aqueous feed mixture comprising the N-(phosphonomethyl)iminodiacetic acid substrate introduced into the catalytic reactor system. As amended, claim 231 further requires crystallizing N-

(phosphonomethyl)glycine product **from the secondary fraction** to produce additional solid N-(phosphonomethyl)glycine product and a secondary mother liquor.

In the process described by Pelyva et al., the sulfuric acid catalyzed oxidation of N-(phosphonomethyl)iminodiacetic acid with hydrogen peroxide is carried out while evaporate is contemporaneously distilled from the oxidation reaction medium to concentrate the oxidation reaction medium. The evaporate is distilled off through a cooler into a receiver. **The entire resulting reaction medium** is cooled to crystallize N-(phosphonomethyl)glycine which is then filtered from the sulfuric acid waste liquor. The sulfuric acid waste liquor is recycled and used as an oxidation medium in which additional N-(phosphonomethyl)iminodiacetic acid is oxidized while evaporate is contemporaneously distilled from the oxidation medium. The process is repeated over several cycles. In each cycle the entire resulting reaction medium is cooled to crystallize N-(phosphonomethyl)glycine and the resulting sulfuric acid waste acid liquor recycled and used as the oxidation medium "heel" in the subsequent reaction cycle. The cited reference fails to teach or suggest dividing the oxidation medium into primary and secondary fractions, much less crystallizing N-(phosphonomethyl)glycine product from both the primary fraction and the secondary fraction as now required in the process defined in claim 231.

In paragraph 15 of the Office action, allowable subject matter is indicated in original claim 234 indirectly depending from claim 231. Accordingly, in view of the inclusion in claim 231 of features from dependent claim 234, namely the requirement of crystallizing N-(phosphonomethyl)glycine product from the secondary fraction to produce additional solid N-(phosphonomethyl)glycine product and a secondary mother liquor, claim 231 as amended and claims 232-233 and 235-241 depending therefrom are submitted as patentable over the disclosure by Pelyva et al.

Rejections under 35 U.S.C. §103(a)

Reconsideration is respectfully requested of the rejection of claims 44-46 under 35 U.S.C. §103(a). The invention defined in the pending claims is submitted as patentable over the disclosure in U.S. Patent No. 3,950,402 (Franz).

Independent claim 44 is directed to process for making an N-(phosphonomethyl)glycine product in which a reaction product solution containing N-(phosphonomethyl)glycine product is produced by catalytically oxidizing an N-(phosphonomethyl)iminodiacetic acid substrate in an oxidation reactor system. N-(phosphonomethyl)glycine product is recovered by two sequential crystallizations from the reaction product solution. More particularly, N-(phosphonomethyl)glycine product is precipitated from the reaction product solution to produce a primary product slurry comprising precipitated N-(phosphonomethyl)glycine product crystals and a primary mother liquor. Precipitated N-(phosphonomethyl)glycine product crystals are separated from the primary mother liquor. In accordance with claim 44 as presently amended, the primary mother liquor is subjected to evaporative heat-driven crystallization to thereby evaporate water from the primary mother liquor, precipitate additional N-(phosphonomethyl)glycine product crystals and produce a secondary mother liquor.

Franz discloses generally the preparation of N-(phosphonomethyl)glycine by the catalytic oxidation of N-(phosphonomethyl)iminodiacetic acid in aqueous media using various oxidizing agents and catalysts. According to Franz, the N-(phosphonomethyl)glycine is "isolated by precipitation, for example, by the addition of a water-miscible organic solvent, evaporation of water, or cooling" (See col. 1, lines 28-31). In Example 1, the reaction mixture resulting from the sulfuric acid catalyzed oxidation of N-(phosphonomethyl)iminodiacetic acid with hydrogen peroxide was first cooled to room temperature to form a precipitate, diluted with excess ethanol and then further cooled to 0°C and stored overnight in a refrigerator before filtering to recover 7.8 g of the N-(phosphonomethyl)glycine-containing

precipitate. The resulting filtrate (i.e., primary mother liquor) was again refrigerated and an additional 0.2 g of product was obtained. In the remaining examples, the oxidation reaction mixture was cooled or subjected to evaporative crystallization (e.g., at reduced pressure) to crystallize the N-(phosphonomethyl)glycine product. In the Examples where the N-(phosphonomethyl)glycine product was crystallized by cooling (See Examples 1-3 and 11), product crystals were recovered by filtering or by centrifuge from the mother liquor (i.e., filtrate or centrate). In the Examples where the N-(phosphonomethyl)glycine product was crystallized by evaporation of the reaction mixture (See Examples 4-10), the oxidation reaction mixture was concentrated to dryness to yield a residue comprising the N-(phosphonomethyl)glycine product and no mother liquor.

As acknowledged in the Office action, Franz fails to teach evaporating water from primary mother liquor to precipitate additional N-(phosphonomethyl)glycine product, much less subjecting primary mother liquor to heat-driven evaporative crystallization to evaporate water from the primary mother liquor, precipitate additional N-(phosphonomethyl)glycine product crystals and produce a secondary mother liquor as now required in the process of claim 44 as amended. However, the Examiner refers to disclosure in Franz in Example 7, at col. 5, lines 59-61, and in Example 11, at col. 6, lines 57-61,[1] as teaching evaporating the reaction mixture to crystallize N-(phosphonomethyl)glycine product and asserts that it would have been obvious to replace

[1] Applicant notes that the cited text in Example 11 does not disclose evaporation of the reaction product mixture to crystallize N-(phosphonomethyl)glycine product. Rather, in example 11, after heating the reaction mixture under reduced pressure to distill solvents, the residual mixture was cooled to 0° C and stirred for 5 hours before filtration to recover the N-(phosphonomethyl)glycine product filter cake. Applicants submit that it is not possible to determine whether any N-(phosphonomethyl)glycine product crystals were formed in Example 11 during evaporative heating of the reaction mixture.

the further cooling of the filtrate in Example 1 and instead evaporate the filtrate because evaporation would allow more complete recovery of the N-(phosphonomethyl)glycine product and would be less expensive.

As noted above, applicants respectfully submit that the Examples of Franz, including the text cited in the Office action, do not teach evaporation of an N-(phosphonomethyl)glycine-containing solution so as to produce N-(phosphonomethyl)glycine product crystals and a mother liquor as is required by the heat-driven crystallization of primary mother in claim 44 as amended. Moreover, the observation in Example 1 that further cooling of the mother liquor filtrate in the refrigerator resulted in precipitation of additional product notwithstanding, Franz ascribes no significance to the possibility of recovering N-(phosphonomethyl)glycine product by two sequential crystallizations from the reaction product solution, particularly a recovery scheme in which primary mother liquor from the first crystallization is subjected to heat driven crystallization. Contrary to the assertion in the Office action, the teaching of Franz would in no way motivate one skilled in the art to modify the procedure in Example 1 and heat the mother liquor filtrate produced upon initial cooling of the reaction mixture. Rather, one skilled in the art following the teaching of Franz that the N-(phosphonomethyl)glycine product can be recovered by evaporation of water would do so in single step wherein the reaction mixture is subjected to evaporative crystallization (See Examples 4-10).

Accordingly, applicants respectfully submit that claim 44 and dependent claims 45 and 46 are patentable over Franz.

Supplemental Information Disclosure Statement

As discussed with the Examiner by telephone on May 14, 2003, a Supplemental Information Disclosure Statement is being prepared for submission in connection with the subject application. Applicants' undersigned attorney is in the process of finalizing the Supplemental Information Disclosure Statement and will file

it before the Examiner again takes up the prosecution of this case.

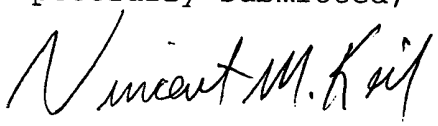
Conclusion

In view of the above, favorable reconsideration and allowance of all pending claims are respectfully solicited.

Applicants request an extension of time to and including November 19, 2003 for filing a response to the above-mentioned Office action. A check in payment of the applicable extension * fee is enclosed.

The Commissioner is requested to charge any fee deficiency of overpayment in connection with this amendment to Deposit Account 19-1345.

Respectfully submitted,



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